

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

What is claimed:

1. (Original) Robot system including at least one mobile robot (10), for treating a surface, which comprises map storage means to store a map of the surface to be treated and means to navigate the, or each, mobile robot (10) to at least one point on a surface, characterized in that the, or each, mobile robot (10) comprises locating means (13,14) to identify its position with respect to the surface to be treated, means to automatically deviate the mobile robot away from its initial path in the event that an obstacle is detected along its path, means to store and/or communicate data concerning the surface treatment performed and any obstacles detected by the locating means (13,14) and emitting means (15) that produce emissions (17) such as symbols, lines, shapes, or written characters in one or more colours for treating at least one point on a surface.
2. (Original) Robot system according to claim 1, characterized in that said emitting means (15) are arranged to dispense at least one of the following: ink, paint, glue, a gas, a liquid, a powder or light to mark, etch, decorate or chemically react with the surface to be treated.
3. (Currently Amended) Robot system according to claim 1 or 2, characterized in that the, or each, mobile robot (10) comprises an on-board computer (12) including map storage means and means to store and/or communicate data concerning the surface treatment performed and any obstacles detected by the locating means (13,14).
4. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 3, characterized in that the, or each mobile robot (10) is programmed to return to an area in which an obstacle was detected after a pre-determined time to check whether the obstacle is still present and whether it is therefore still hindered from performing surface treatment in that area.
5. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 4, characterized in that the locating means (13,14) comprise at least one of the following types of sensor; optical such as a laser, thermal imaging, electro-magnetic, sonar, GPS, pressure, motion, angle detection, contact or direction sensors.

6. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 5, characterized in that it comprises means to differentiate between different objects or different parts of the same object by detecting differences in the reflectivity of the different materials constituting those objects.

7. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 6, characterized in that the, or each, mobile robot (10) comprises wired or wireless communication means such as an electric or optic cable, an antenna or BluetoothTM hardware to communicate with a remote user, control system or computer network or another robot.

8. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 7, characterized in that the communication means are arranged to report that an obstacle has been encountered by a mobile robot (10) if the obstacle has not been removed after a pre-determined time such as a few seconds.

9. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 8, characterized in that the, or each, mobile robot (10) traverses the surface to be treated.

10. (Currently Amended) Robot system according to ~~any of claims 1-8~~ claim 9, characterized in that the, or each, mobile robot (10) traverses a surface other than the surface to be treated.

11. (Currently Amended) Robot system according to ~~any preceding claims~~ claim 10, characterized in that the, or each, mobile robot (10) comprises deletion means, instead of, or in addition to the emitting means (15), which are arranged to remove emissions (17) produced by the emitting means (15) of the same or another mobile robot (10) in the same or a previous run respectively.

12. (Original) Method for treating a surface using a robot system including at least one mobile robot (10), comprising inputting a map of a surface to be treated into a computer (12) located on-board or remotely to the, or each, mobile robot (10), navigating the, or each, mobile robot to at least one point on a surface, characterized in that the, or each, mobile robot (10) draws up a map of the surface using information collected from on-board or remote locating means (13,14) used to identify the position of the robot with respect to the surface to be treated and automatically deviates away from its initial path in the event that an obstacle is detected along its path, that the, or each, mobile robot (10) stores and/or communicates data concerning the surface treatment performed and the obstacles detected by the locating means

(13,14) and that emissions (17) such as symbols, lines, shapes, or written characters in one or more colours are produced by emitting means (15) for treating at least one point on the surface.

13. (Original) Method according to claim 12, characterized in that map data and, if available, path data is inputted in the form of a file such as a file from a CAD-system.

14. (Currently Amended) Method according to claim 12 ~~or 13~~, characterized in that the, or each, mobile robot (10) is programmed to return to an area in which an obstacle was detected after a predetermined time to check whether the obstacle is still present and whether it is therefore still hindered from performing surface treatment in that area.

15. (Currently Amended) Method according to ~~any of claims 12-14~~ claim 14, characterized in that the, or each, mobile robot (10) is instructed to return to areas in which an obstacle was identified after the obstacle has been removed.

16. (Currently Amended) Method according to ~~any of claims 12-15~~ claim 15, characterized in that one or more points or parts of a permanent structure having a complex geometry and located in the working area of the, or each mobile robot (10) is marked with reflective material, such as reflective tape, to strengthen the signals reflected from said points or parts to facilitate correspondence between data from the locating means and data from the robot system's map.

17. (Currently Amended) A computer readable medium ~~Computer program product~~, characterized in that it contains computer program code means for making a computer or processor carry out the method according to ~~any of claims 12 to 16~~ claim 12.

18. (Cancelled)

19. (Currently Amended) A computer readable medium ~~Computer program product~~ according to claim 17 ~~or 18~~, characterized in that it further comprises computer executable instructions for the emitting means (15) used to treat the surface.

20. (Currently Amended) A computer readable medium ~~Computer program product~~ according to ~~any of claims 17-19~~ claim 17, characterized in that it further contains data stored thereon containing ~~contains~~ a map of a surface and optionally a pre-programmed path to direct the, or each, mobile robot around that path.

21. (Cancelled)

22. (Cancelled)

23. (New) A robot system according to claim 1, characterized in that the, or each mobile robot (10) is programmed to return to an area in which an obstacle was detected after a pre-determined time to check whether the obstacle is still present and whether it is therefore still hindered from performing surface treatment in that area.

24. (New) A robot system according to claim 1, characterized in that the locating means (13,14) comprise at least one of the following types of sensor; optical such as a laser, thermal imaging, electro-magnetic, sonar, GPS, pressure, motion, angle detection, contact or direction sensors.

25. (New) A robot system according to claim 1, characterized in that it comprises means to differentiate between different objects or different parts of the same object by detecting differences in the reflectivity of the different materials constituting those objects.

26. (New) A robot system according to claim 1, characterized in that the, or each, mobile robot (10) comprises wired or wireless communication means such as an electric or optic cable, an antenna or BluetoothTM hardware to communicate with a remote user, control system or computer network or another robot.

27. (New) A robot system according to claim 1, characterized in that the communication means are arranged to report that an obstacle has been encountered by a mobile robot (10) if the obstacle has not been removed after a pre-determined time such as a few seconds.

28. (New) A robot system according to claim 1, characterized in that the, or each, mobile robot (10) traverses the surface to be treated.

29. (New) A robot system according to claim 1, characterized in that the, or each, mobile robot (10) traverses a surface other than the surface to be treated.

30. (New) A robot system according to claim 1, characterized in that the, or each, mobile robot (10) comprises deletion means, instead of, or in addition to the emitting means (15), which are arranged to remove emissions (17) produced by the emitting means (15) of the same or another mobile robot (10) in the same or a previous run respectively.

31. (New) The robot system of claim 1 wherein the at least one mobile robot is operative for indicating or marking out a physical lay-out on any indoor or outdoor surface such as at an exhibition, a trade fair or construction site.

32. (New) The robot system of claim 1 wherein the at least one mobile robot is operative for marking out a physical lay-out at a site under hazardous or hygienic conditions.

33. (New) A method according to claim 12, characterized in that the, or each, mobile robot (10) is programmed to return to an area in which an obstacle was detected after a predetermined time to check whether the obstacle is still present and whether it is therefore still hindered from performing surface treatment in that area.

34. (New) A method according to claim 12, characterized in that the, or each, mobile robot (10) is instructed to return to areas in which an obstacle was identified after the obstacle has been removed.

35. (New) A method according to claim 12, characterized in that one or more points or parts of a permanent structure having a complex geometry and located in the working area of the, or each mobile robot (10) is marked with reflective material, such as reflective tape, to strengthen the signals reflected from said points or parts to facilitate correspondence between data from the locating means and data from the robot system's map.

36. (New) The method of claim 12 further comprising marking out a physical lay-out at a site under hazardous or hygienic conditions by the at least one robot.

37. (New) The method of claim 12 further comprising marking out a physical lay-out at a site under hazardous or hygienic conditions by the at least one robot.